UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/597,067	MERZ ET AL.
Office Action Summary	Examiner	Art Unit	
	SANTIAGO GARCIA	4147	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>10 July 2006</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>18-34</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>18-34</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>10 July 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/10/06</u>.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)   **Office Action Summary**   Part of Paper No./Mail Date 20090526

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 18, the term "and/or" line 9 renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d). Claims 19-34 are dependent on claim 18 therefore also rejected.

Regarding claim 22, the term "for example" in line 5 renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1.   Claim18-23, 25, 31, 33 and 34 are rejected under 35 U.S.C. 102(b) as being

anticipated by Cowie (US 2003/0095609).

As per claim 18, Cowie teaches, a wireless data communication method between

a transmitter device having a first wide band antenna for transmitting ultra wide band

coded data signals (Cowie, fig.8 code source 812 is providing the code and antenna

824 is transmitting the coded data signal. See ¶ [0059] and [0151]),

and a receiver device having a second wide band antenna for receiving direct

path and/or multiple path coded data signals (Cowie, fig.9 and 7C antenna 904 receives

the signal. See ¶ [0060], [0155] and [0156] for receiver and antenna. Multi-path

propagation is described in ¶ [0127]-[0128] as path 1 and 2)

the transmitted data being defined by one or more sequences of N pulses where

N is an integer number higher than 1 (Cowie, fig.2A N is equal to the total number of

pulses. N must be one in order to have any type of information. See ¶ [0092]),

the arrangement of N pulses of each sequence representing encoding of data

relating to the transmitter device (Cowie, The pulses are encoded as shown in ¶ [0151]

"The precision timing generator 808 supplies synchronizing signals 810 to the code

source 812 and utilizes the code source output 814, together with an optional, internally

generated subcarrier signal, and an information signal 816, to generate a modulated,

coded timing signal 818. See also figure 7A coded received pulse train),

wherein the N pulses of one pulse sequence of direct path and/or multiple path

coded data signals received by the receiver device are each processed in one of N

corresponding reception time windows (Cowie, fig. 11 time windows 1100(a), b, c and d.

Also see ¶ [0131] and [0167]-[168]),

each of the N reception time windows being positioned in time as a function of a

known theoretical arrangement of the N pulses of the signals transmitted by the

transmitter device (Cowie, fig.11 and ¶ [0167]-[168] The pulses are positioned in groups

of 4 in this case which would be the theoretical arrangement),

and wherein an operation of adding the N windows is carried out in the receiver

device (Cowie, fig.9 component 934 in the receiver and ¶ [0158]) so that the added

pulse amplitude level is higher than the noise amplitude level captured by the receiver

device (Cowie, ¶ [0118]-[0120] Time-modulation is used to carry out coherent

integration, or as described by applicant window addition to obtain processing gain and

to distinguish the added pulses from the noise of the receiver. Therefore by using time-

modulation the amplitude of the added pulses must be higher in order to distinguish

from the noise. By integrating over many pulses overcomes the impact of interference

or noise.).

As per claim 19, Cowie further teaches, a communication method according to

claim 18, wherein a clock signal frequency for clocking various operations of the

receiver device is proportionally adapted to a reference clock signal frequency of the

transmitter device (Cowie, ¶ [0118] and [0157] "when the transmitted impulse signal is

coded and the impulse radio receiver template signal 706 is synchronized using the

identical code," When using identical code the two clocks in the receiver and transmitter must be synchronized.),

which is used for generating ultra- wide band coded data signals (Cowie, receiver in fig.8 ¶ [0118] and [0157]), by controlling the pulse amplitude level of a final window adding the N windows until said amplitude level is maximized (Cowie ¶ [0157] "This time base 918 may be adjustable and controllable in time, frequency, or phase, as required by the lock loop in order to lock on the received signal 908." By having control over the time, frequency or phase the amplitude level can be maximized).

As per claim 20, Cowie further teaches, a communication method according to claim 18, wherein the transmitter device transmits coded data signals (Cowie, ¶ [0078] The transmitter is producing coded data signals), in which the data is coded by pulse position modulation (Cowie, ¶ [0076], [0090], [110] "Impulse radio can use many types of modulation, including amplitude modulation, phase modulation, frequency modulation, time-shift modulation (also referred to as pulse-position modulation or pulse-interval modulation".)

As per claim 21, Cowie further teaches, a communication method according to claim 18, wherein the coded data signals include a synchronization frame allowing the receiver device to recognize the transmitter device and to be synchronized on said frame before demodulating the received data (Cowie, ¶ [0151] and [0157] In order to transmit and synchronize a synch frame must be present before going into component

932 demodulator. Furthermore component 808 provides the synch signals), said
synchronization frame being composed of one or several sequences of N pulses of
determined pulse repetition frequency (Cowie, ¶ [0151] Synch signals are included in
the output signal therefore it is a plurality of N pulses).

As per claim 22, Cowie further teaches, a communication method according to
claim 18, wherein the identical width of each of the N time windows (Cowie, fig.11
shows identical width N times windows) is smaller than the reverse of the mean pulse
repetition frequency of a sequence of coded data signals to be transmitted (Cowie, This
is time modulation which is described in ¶ [0015].),

and wherein said time window width is adapted to receive the pulses of the direct
path and multiple path signals captured by the receiver device (Cowie, Multi-path
propagation is described in ¶ [0127]-[0128] as path 1 and 2),

for example of width greater than 20 ns (Cowie, An ultra-wideband transmitter
transmits in nano second pulses. Therefore a group of pulses in a window or instant in
time could be 20ns).

As per claim 23, Cowie further teaches, a communication method according to
claim 18, wherein the transmitter device includes a first oscillator stage delivering at
least one first clock signal at a first defined frequency (Cowie, fig.8 and ¶ [150] "The
time base 804 typically comprises a voltage controlled oscillator (VCO), or the like,
having a high timing accuracy and low jitter, on the order of picoseconds (Ps)."),

a first signal processing unit clocked by the clock signal provided by the first oscillator stage in order to modulate the data to be transmitted (Cowie, fig.8 and ¶ [150] and [152] 806 precision timing modulator.),

and a unit for shaping the N pulses of each sequence to be transmitted by the first wide band antenna of the transmitter device as a function of the data modulation provided by the first signal processing unit (Cowie, fig.8 and ¶ [153] The pulse generator takes the modulated data from the first signal processing unit 806 precision timing modulator. Also fig.8 antenna 824),

wherein the receiver device includes a second oscillator stage delivering at least one second clock signal at a second defined frequency (Cowie, fig.9 and ¶ [157] 942 lock loop filter must contain an oscillator in order to control 918 Time Base.),

a second signal processing unit connected to the second oscillator stage (Cowie, fig.9 and ¶ [157] and [159] 914 precision timing modulator.),

and an analogue-digital conversion stage for analogue signals relating to the coded data signals received by the second wide band antenna (Cowie, fig.9 The A/D conversion is inherent to happen in component 932 Sub-carrier Demodulator. Baseband signal (analogue) 912 is going into 932 and out comes digital data therefore there must be an A/D converter inside 932 ¶ [157] and [159]),

wherein an operation of adding the N time windows is performed before or after the analogue-digital conversion of the analogue signals (Cowie, fig.9 The A/D conversions happens before the summation as shown in fig.9),

and wherein the analogue signal pulses are sampled in the analogue- digital conversion stage by at least one sampling signal supplied by the second signal processing unit (Cowie, fig.9 ¶ [156]-[157] 910 is a correlator or sampler. 928 which is a signal produced by the receiver to match the received signal provides a signal to the sampler 910 which outputs 912 baseband which then goes to 932 to convert into digital),

the sampling signal having a frequency proportional to the second frequency of the second clock signal (Cowie, fig.9 The precision timing generator 914 provides synchronizing signals 920 to the code source 922 and receives a code control signal 924 from the code source 922. Then this signal is going to sampler 910 which receives the synch signals as well ¶ [157]. Also see paragraph [160]).

As per claim 25, Cowie further teaches a communication method according to claim 19, wherein each reception window positioned in time in relation to the known theoretical place of each pulse of the received data signals is centered relative to a theoretical reference value or relative to the maximum added pulse amplitude of the direct path and/or multiple path signals captured by the receiver device (Cowie, ¶ [157] By the transmitter and receiver being synchronized and by component 910 adding up the pulse windows then the signals must be centered according to the reference value of the transmitter).

As per claim 31, Cowie further teaches, the receiver device for implementing the communication method according to claim 18, including an oscillator stage (Cowie, fig.8 804 has an oscillator) delivering at least one clock signal at a defined frequency , a signal processing unit (Cowie, fig.9 916 is delivering a clock signal. Fig.9 also shows 932, 934, 936, 938) connected to the oscillator stage, and an analogue-digital conversion stage for the coded data signals received by a wide band antenna (Cowie, fig.9 The A/D conversion is inherent to happen in component 932 Sub-carrier Demodulator. Baseband signal (analogue) 912 is going into 932 and out comes digital data therefore there must be an A/D converter inside 932 ¶ [157] and [159])),

wherein the signal processing unit includes time window addition means for coherently adding up the pulses of each of the N time windows (Fig.9 pulse sum 934 and ¶ [158]. Also see figures 11 and ¶ [0167]-[0168], the numbers 11009a-d also represent time windows, which are positioned in time as function of theoretical arrangement of the transmission coding, each window containing four pulses 1101a-1104a which are integrated, thereby amounting to carrying out an addition of the N windows).

As per claim 33, Cowie further teaches a receiver device according to claim 31, wherein the time window addition means receive digital signals from the analogue-digital conversion stage for adding up the digital windows (Cowie, fig.9 component 934 must have the D/A converter and must be before addition as explained in ¶[0157]-[0159]).

As per claim 34, Cowie further teaches a receiver device according to claim 31, wherein the time window addition means receive analogue data signals from the second wide band antenna in order to add up the analogue windows (Cowie, fig.9 component 934 must have the D/A converter and must be before addition as explained in ¶[0157]-[0159]. Analogue is considered to be a commonplace place alternative to the addition of digital windows).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowie (US 2003/0095609) in view of Cattaneo (US 2003/0058963).

As per claim 24, Cowie further teaches a communication method according to claim 23.

Cowie does not teach, wherein the time window signals are successively added and stored in at least one register of the second signal processing unit.

Cattaneo teaches, wherein the time window signals are successively added (Cattaneo, fig.13 Showing the time window signals being successively added. Also see ¶[0068])

and stored in at least one register of the second signal processing unit (Cattaneo,

It is inherent that the sliding correlation unit of fig.13 must have a register/buffer).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to modify Cowie's system to include the feature of adding the time

windows successively, as taught by Cattaneo.

The motivation would be to be able to be able to improve performance of the

wireless communication system (see col.3, lines 49-50).

3.   Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowie

(US 2003/0095609) in view of Batra (US 7,397,870).

As per claim 26, Cowie further teaches a communication method according to

claim 20, prior to addition of the resulting pulses of each time window (Cowie, fig.9 the

correlator is 910 which is before the pulse sum).

Cowie does not teach, wherein the reference signals of identical polarity to the

polarity of the coded signals received by the receiver device are correlated.

Batra teaches, wherein the reference signals of identical polarity to the polarity of

the coded signals received by the receiver device are correlated (Batra, col 11 lines 24-

29 In order to accurately detect the pulses with reversed polarity, two signed match

filters 905 and 925 can be used. The first signed match filter 905 is used to correlate

and integrate pulses of one polarity while the second signed match filter 925 is used to

correlate and integrate pulses of a reversed polarity. This shows that is known that

correlating signals with the same polarity is known).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Cowie's system to include the feature correlating pulses of the same polarity of Batra .

The motivation would be to be able to perform synchronization before performing the integration or addition of windows.

4.   Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowie (US 2003/0095609) in view of Sahinoglu (US 7,436,909) and further in view of Iwakami (US 5,684,920).

As per claim 27, Cowie further teaches a communication method according to claim 23, wherein the second signal processing unit includes means for adding the digital windows (Cowie, fig.9 component 934 must have the D/A converter and must be before addition as explained in ¶[0157]-[0159]. Analogue is considered to be a commonplace place alternative to the addition of digital windows)

wherein before or after the time window addition operation (Cowie, fig.9 934 pulse sum),

of defined length T_N, each of the sub-windows being time shifted in relation to each other by a determined time interval from the start of the reception time window to the end of said time window (Cowie, fig.11 1100(a) to start of 1100(b) is the determined time interval this is also the length T_N),

Cowie does not teach, the means for estimating the time of arrival of the coded data signal. Cowie further does not teach the method in calculating several absolute value maximum amplitude values for signals in time sub-windows,

and in estimating a noise amplitude level by selecting the minimum amplitude value from all the calculated amplitude values

Sahinoglu teaches, means for estimating the time of arrival of the coded data signals (Sahinoglu, col 2 lines 1-4 "Our invention provides a method for estimating a time of arrival (TOA) of a signal at a radio transceiver in a wireless communications network. For the purpose of this description, the transceiver estimates the TOA for a received signal. However, it should be understood that the transceiver can transmit and receive),

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Cowie's system to include the feature of estimating the time of arrival of a signal, as taught by Sahinoglu.

The motivation would be to be able to improve synchronization by estimating the time of arrival.

Cowie in view of Sahinoglu does not teach, the method includes steps consisting in calculating several absolute value maximum amplitude values for signals in time sub-windows,

and in estimating a noise amplitude level by selecting the minimum amplitude value from all the calculated amplitude values

Iwakami teaches, the method includes steps consisting in calculating several

absolute value maximum amplitude values for signals in time sub-windows (Iwakami,

¶[047] "amplitude calculation part 32' to calculate their spectrum amplitude envelope"),

and in estimating a noise amplitude level by selecting the minimum amplitude

value from all the calculated amplitude values (Iwakami, ¶[047] "amplitude calculation

part 32' to calculate their spectrum amplitude envelope," By calculating the amplitude of

the signal the amplitude of the noise is also calculated).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to modify Cowie in view of Sahinoglu to include the feature of calculating

the amplitude level of a signal, as taught by Iwakami.

The motivation would be to be able to recognize noise from the actual data being

sent.

5.   Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowie

(US 2003/0095609) in view of Barnes (US 6,552,677).

As per claim 28, Cowie teaches a communication method according to claim 23.

Cowie does not teach, wherein it includes steps for calculating a positive

envelope of the signals of one time window consisting in determining all the zero

crossing positions Pi of the time window signals

in determining the coordinates of the absolute value amplitude maximum in each

interval from Pi to Pi+1, with i ranging from 1 to I-1, I being an integer number higher

than 3, and in calculating the envelope by using a specific interpolation algorithm

passing through the determined coordinates.

Barnes teaches, wherein it includes steps for calculating a positive envelope of

the signals of one time window consisting in determining all the zero crossing positions

Pi of the time window signals (Barnes, col 14 lines 30-39 and fig.7 By having the

envelope 720 being formed the measurement of the times between zero-crossing and

a peak then all zero crossing positions are Pi are calculated),

in determining the coordinates of the absolute value amplitude maximum in each

interval from Pi to Pi+1 (Barnes, col 14 lines 35-39 and fig.7 Pi to Pi+1 is just simply

taking the point at zero-crossing Pi and the peak Pi+1),

with i ranging from 1 to I-1 (Barnes, col 14 lines 37-39 the negative displacement

being -1), I being an integer number higher than 3 (Barnes, col 14 lines 48-51. "I" is

approximately equal to four), and in calculating the envelope by using a specific

interpolation algorithm passing through the determined coordinates (Barnes, col 14 lines

43-47 "A detection envelope 720 is then calculated by squaring the received impulse

waveform 700 and the PZD delayed waveform 716. These are summed and the square

root is taken yielding the definition of the envelope 720." The formation of the 720 is the

interpolation algorithm).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to modify Cowie's system to include the feature of calculating the

envelope of the signal being received, as taught by Barnes.

The motivation would be to be able to reduce processing cost, in terms of capacity, throughput, time and money, is significantly as taught by Barnes (col 15 lines 15-16).

6.   Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowie (US 2003/0095609) in view of Barnes (US 6,552,677) and further in view of Ross (US 5,337,054).

As per claim 29, Cowie in view of Barnes teaches a communication method according to claim 28, wherein it includes steps for calculating the time of arrival of the first signals captured by the receiver device consisting in calculating an amplitude threshold th based on the amplitude maximum of the envelope (Barnes, fig.7 col 14 lines 30-33 Shows that the max amplitude 708 of the envelope is calculated),

in estimating the maximum local point of the envelope at the coordinates which directly follow the point where the envelope passes above the threshold th (Barnes, fig.7 the highest point 706 would be in line with the highest point of the noise if a line is to be drawn threw it),

and in determining the time of arrival of the first signals captured by the receiver device at the zero crossing or another value of the determined function (Barnes, fig.7 and col 14 lines 35-39 the arrival or a new pulse happens at the zero crossing).

Cowie in view of Barnes does not teach, and the minimum local point of the envelope at the coordinates which precede the point where the envelope passes above the threshold th, in calculating the intermediate coordinates between the minimum point

and the maximum point, in approximating at the position of intermediate coordinates a

selected segment of samples of the envelope with given function, such as an affine

function, and an estimated noise amplitude level, in estimating the rising edge of the

positive envelope where the threshold th is exceeded for the first time.

      Ross teaches, the minimum local point of the envelope at the coordinates which

precede the point where the envelope passes above the threshold th (Ross, fig.3a and

col 4 lines 35-39),

      in calculating the intermediate coordinates between the minimum point and the

maximum point (Ross, fig.3n alarm level would be intermediate coordinates as shown

also in fig.3a that the noise spike is less than the alarm level in terms of amplitude),

      in approximating at the position of intermediate coordinates a selected segment

of samples of the envelope with given function (Ross, col 4 lines 28-44 the samples

given by the spike and the register colleting those spikes),

      such as an affine function (Ross, fig.3a and 3b affine function is not described in

the spec. Therefore it is taken as sequential points. Such as the noise spike in fig.3a

and the alarm level in fig. 3b),

      and an estimated noise amplitude level, in estimating the rising edge of the

positive envelope where the threshold th is exceeded for the first time (Ross, fig. 3 and

col 4 lines 30-34 Threshold detector 5 is detecting the spike of the amplitude of the

noise therefore this is the same as estimating the noise amplitude.),

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Cowie in view of Barnes system to include the feature of having a threshold detector, as taught by Ross.

The motivation would be to be to provide a system with adjunct module to increase the sensitivity of detecting a signal as configured (see Ross, col. 2, line 15-17).

7.   Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowie (US 2003/0095609) in view of Lomp (US 5,991,332).

As per claim 30, Cowie teaches a communication method according to claim 23.

Cowie does not teach, wherein the second signal processing unit includes control means for providing control signals to digital window addition means in order to modify the time or mean repetition frequency scale of N windows to be added from digital window addition means, wherein a re-sampling operation is carried out in the second signal processing unit of the receiver device with a different re-sampling frequency from the sampling frequency of the analogue-digital conversion stage, said re-sampling frequency generated by the control means being able to be higher than the sampling frequency in order to increase precision for positioning purposes.

Lomb teaches, wherein the second signal processing unit includes control means (Lomb, fig.11 element 1303 is the control means. See col. 31 lines 19-22)

for providing control signals to digital window addition means (Lomb, fig.11 is controlling the receiver. The receiver contains the match filter in figure 16 adding up sample intervals considered to be equivalent of time windows; see col 17, lines 11-14)

in order to modify the time or mean repetition frequency scale of N windows to be added from digital window addition means (Lomb, fig.3c and col 15 lines 53-64 The tracking circuit which is in fig.3c has its own oscillator therefore able to modify the frequency of the interval samples),

wherein a re-sampling operation is carried out in the second signal processing unit of the receiver device with a different re-sampling frequency from the sampling frequency of the analogue-digital conversion stage (Lomb, fig.3c re-sampling is taking place by element 303, see col 16 lines 31-35. There is also an A/D converter converting x(t) which is the signal out of the matched filter, see col 18 lines 10-13),

said re-sampling frequency generated by the control means being able to be higher than the sampling frequency in order to increase precision for positioning purposes (Lomb, fig.3c matched filter has an oscillator able to produce its own frequency therefore able to have a higher frequency, see col 15 lines 54-63).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Cowie's system to include a control means to control the pulse sum frequency, as taught by Lomp.

The motivation would be to improve signal quality by sampling the signal twice.

8.   Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cowie

(US 2003/0095609) in view of Cattaneo (2003/0058963) and further in view of

Takamura (US 2003/0035465).

        As per claim 32, Cowie teaches a receiver device according to claim 31,

        which is used for generating ultra-wide band coded data signals (Cowie, fig.8

code source and pulse generator generate a coded data signal),

        Cowie does not teach, wherein the clock signal frequency of the oscillator stage

is proportionally adapted by the processing unit to a reference clock signal frequency

of an oscillator stage of the transmitter device

        by controlling the pulse amplitude level of a final addition window of the N

windows from the addition means until said amplitude level is maximized

        Cattaneo teaches, wherein the clock signal frequency of the oscillator stage is

proportionally adapted by the processing unit to a reference clock signal frequency of

an oscillator stage of the transmitter device (Cattaneo, fig. 7 and ¶[056] Shows an

oscillator hooked up to reference clock CLKe).

        At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to modify Cowie's system to include a reference clock hooked up to an

oscillator as taught by Cattaneo.

        The motivation would be to be to improve sampling means as taught by

Cattaneo.

Cowie in view of Cattaneo does not teach, by controlling the pulse amplitude level of a final addition window of the N windows from the addition means until said amplitude level is maximized

Takamura teaches, by controlling the pulse amplitude level of a final addition window of the N windows from the addition means until said amplitude level is maximized (Takamura, Fig.3 component 807 and ¶[037] By having control of the amplitude the level may be maximized according a predefined alternation factor).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Cowie in view of Cattaneo to include an amplitude alternation means as taught by Takamura.

The motivation would be to be to have the signals not interfere with interference or noise.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SANTIAGO GARCIA whose telephone number is (571)270-5182. The examiner can normally be reached on MONDAY- FRIDAY 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hai, Tran can be reached on (571) 272-7305. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

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800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SG/
06/08/2009

/Hai Tran/

Supervisory Patent Examiner, Art Unit 4147